

**ANNEX  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AMES RESEARCH CENTER  
AND  
MICROSOFT CORPORATION  
UNDER SPACE ACT UMBRELLA AGREEMENT NO. 34677 / SAA2-403624  
(ANNEX NUMBER ONE)**

**ARTICLE 1. PURPOSE**

This Annex shall be for collaboration on the development of prototype TestBed connectivity and TestBed stakeholders' algorithms between the NASA Air Traffic Management (ATM) projects and the Azure Simulation Platform being developed by Microsoft Studio Alpha (MSA). Initially, TestBed will connect with the Studio Alpha simulation environment to provide computer-simulated routing/path planning for computer models of Unmanned Aerial Vehicle (UAV) and Urban Air Mobility (UAM) autonomous vehicles in the Studio Alpha simulation environment. These algorithms will then be combined with publicly available real-world traffic information as provided by NASA to evaluate the interaction of the autonomous routing algorithms with the weather, urban environment, and real-world traffic.

Under this collaboration, NASA will configure the TestBed to prepare for future collaborative simulations. In the first phase, NASA will start with a test simulation. The test simulation is intended to assess how TestBed can facilitate an initial use case of UAM operators planning their flights together in a way to remain safe and not to congest the airspace and airports, including vertiports. Microsoft will work with its team to connect their simulation capabilities and supporting tools to TestBed. NASA and Microsoft will then collaboratively determine the simulation performance of the connected platforms and tools for supporting future collaborative research and development in future annexes. This effort is also expected to guide the Parties in specific future collaborative research and development direction.

The overall goal for this collaborative effort is to demonstrate the effects of autonomous routing for 100 package delivery drones and 20 urban air mobility craft flying within 10 km radius from 1 medium density airport while considering surrounding real-world manned traffic, urban environment, and weather conditions.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

**ARTICLE 2. RESPONSIBILITIES**

A. NASA ARC will use reasonable efforts to:

1. Configure the TestBed and report on end point (URL) specification of Internet Protocol address, port number, and communication protocols to MSA;
2. Provide MSA with web access to TestBed software to enable simulation preparation testing, including design/configuration, to allow any future collaborative simulation with TestBed users such as the System-Wide-Safety project researchers;
3. Provide MSA with TestBed access to NASA ATM data, such as System Wide Information Management (SWIM), as test data that can be sent from TestBed and received by MSA application;
4. Provide MSA with software in the form of TestBed Software Development Kit (SDK) containing example adapters, ATM Application Services Interface examples, and support tools and relevant documentation to help MSA create a new adapter to enable sending and receiving test data between the TestBed and MSA applications;
5. Work with MSA to conduct mutually beneficial test or example simulations to accelerate or improve NASA research using the TestBed;
6. Provide access, including any necessary NASA IT prerequisites or security requirements, such as an Interconnect Security Agreement (ISA to MSA) to enable connectivity between the TestBed and MSA applications.

B. Partner will use reasonable efforts to:

- (1) Cooperate with NASA and follow NASA IT prerequisites and security requirements, such as an ISA, to enable connectivity with the TestBed;
- (2) Protect credentials and access to systems that may be provided by NASA in accordance with NASA regulations and policies;
- (3) Identify a cloud instance and application to be used for testing connectivity with the TestBed;
- (4) Provide NASA with network connectivity and end point (URL) specification such as Internet Protocol address, port number, and communication protocols to the TestBed to support the connectivity testing described above;
- (5) Develop a prototype adapter to enable testing with the NASA TestBed. The adapter will be shared with NASA for lessons-learned purposes.
- (6) Provide NASA with documented feedback on TestBed performance, usability and other suggested improvements that will improve the TestBed;
- (7) Work with NASA to conduct mutually beneficial simulations to accelerate or improve NASA research using the TestBed.

### ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

<b>Milestone</b>	<b>Estimated Completion Date</b>
Confirm Partner's Security Plan (NASA) as part of ISA completion	1 month after Effective Date
Complete Interconnection Security Agreement (ISA) (Both Parties)	2 months after Effective Date
Complete connectivity between NASA ATM TestBed (NAT) and MSA Services (Both Parties)	1 month after ISA is completed (3 months after Effective Date)
Login test from MSA to TestBed (Partner)	1 month after ISA is completed (3 months after Effective Date)
Define Test Simulation Scenario and Application Programming Interface (Both Parties)	2 months after Effective Date
Iteratively develop and test TestBed-MSA Application Adapter (Both Parties)	3 months after Effective Date
Complete Phase 1 user interface for designed test simulation scenario (Both Parties)	3 months after ISA is completed
Develop PowerBI Phase 1 reporting interface	4 months after Effective Date
Integrate TestBed planning algorithms and SWIM data with filtered-in MSA simulation (Partner)	5 months after Effective Date
Demonstrate design, execution, and analysis of target scenario	6 months after Effective Date
Document lessons learned (Both Parties)	18 months after Effective Date

#### **ARTICLE 4. FINANCIAL OBLIGATIONS**

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, (31 U.S.C. § 1341).

#### **ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS**

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of two years.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

The Disclosing Party's Background Data, if any, will be identified in a separate document.

2. Third Party Proprietary Data:

The Disclosing Party's Third-Party Proprietary Data, if any, will be identified in a separate document.

3. Controlled Government Data:

The Disclosing Party's Controlled Government Data, if any, will be identified in a separate document.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

ARC-17857-1A: NASA ATM TestBed Software Development Kit Build 2.x.

#### ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or one year and six months from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

#### ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

#### ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

##### Management Points of Contact

NASA Ames Research Center  
Matt Holtrust  
Agreement Manager  
Mail Stop: 223-3, Room 100

Microsoft Corporation  
Name: Michael Zyskowski  
Title: Technical Director  
Microsoft Corporation

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matthew.j.holtrust@nasa.gov

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Redmond, WA 98052  
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Michael.Zyskowski@microsoft.com

#### Technical Points of Contact

NASA Ames Research Center  
Kee Palopo  
Project Manager  
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kee.palopo@nasa.gov

Microsoft Corporation  
James Piavis  
Principal Program Microsoft  
One Microsoft Way  
Redmond, WA 98052  
Phone: 435-704-1322  
Email: Jim.piavis@microsoft.com

#### ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

#### ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AMES RESEARCH CENTER**

**MICROSOFT CORPORATION**

BY: \_\_\_\_\_  
Huy K. Tran  
Director of Aeronautics

BY: *Heidi Kobylski*  
Name: Heidi Kobylski  
Title: Federal GM- CIV

DATE: \_\_\_\_\_

DATE: 9 Jul 2021